Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In re	)	
	)	
Amendment of Part 90 of the	)	PR Docket No. 93-61
Commission's Rules to Adopt	)	
Regulations for Automatic	)	
Vehicle Monitoring Systems	)	

To: The Commission

COMMENTS OF AD HOC GAS DISTRIBUTION UTILITIES COALITION ON INFORMAL STAFF BAND SEGMENTATION PROPOSAL

An ad hoc coalition of natural gas distribution utilities ("Gas Utilities"), by counsel, submit their comments on the proposal for segmenting the 902-928 MHz band informally advanced recently by the staff.[1/] As the Gas Utilities show below, they continue to believe that the solution which is most in the public interest is to relocate wide-band Location and Monitoring Service ("LMS") provides to another band with clean spectrum. If the Commission is either unable or unwilling to take that approach, however, the Gas Utilities suggest below certain changes to the staff proposal to minimize the potential adverse effects of sharing the 902-928 MHz band between LMS and Part 15 users.

1. ***Introduction.*** As the Gas Utilities have previously explained, they employ Part 15 devices for automatic meter reading ("AMR"), operating in the 902-928 MHz band. The record in this proceeding shows that the manufacturer of this AMR device, used by most of the Gas Utilities, Itron, has stated that more than 3,000,000 of these devices have been sold to date. Millions more

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[1/] Last week, members of the FCC staff contacted certain Part 15 users and requested comment on the proposal discussed herein.

are planned for installation in the near future by various utility companies. The Gas Utilities' interest in this proceeding is to protect the public's and the public utility industry's existing substantial investment in AMR, and to ensure that the important public interest benefits of AMR systems will continue to be available to utility subscribers.

2. The staff has informally proposed to segment the 902-928 MHz band as follows: Multilateration systems would be allocated at 904-910 MHz and 920-926 MHz; non-multilateration systems would be allocated at 902-904 MHz, 910-920 MHz and 926-928 Mhz. Use of the 910-920 MHz band by multilateration systems is also an option, with certain restrictions being imposed. The entire band would be available for Part 15 use with special "threshold" rules applying to the two six megahertz multilateration sub-bands,[2/] with LMS and Part 15 being of "co-equal" status in the 910-920 MHz band, and with Part 15 use remaining secondary outside the 910-920 MHz sub-band.

3. The Gas Utilities do not minimize the difficulty this proceeding presents for decision. Part 15 devices are spread

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[2/] Under these threshold rules, Part 15 users would be required to resolve interference to LMS systems if any of the following conditions apply:

1. The Part 15 device is using an outdoor antenna which is more than five meters above ground level;

2. The Part 15 device is using equipment that does not meet revised Rule Section 15.247(b)'s limitation regarding antenna gain; or

3. The Part 15 device is a field disturbance device operating under Rule Section 15.245.

throughout the 902-928 MHz band. The Commission has encouraged their development and usage. By the same token, the Commission made a tentative allocation of this band for Automatic Vehicle Monitoring Systems, now proposed as LMS, some 20 years ago when Part 15 spread spectrum technology did not exist. Fundamentally, the use of relatively high-powered LMS systems and low-powered Part 15 devices is not compatible.[3/] Moreover, Part 15 and LMS are but two users of the band. Amateur operations, Industrial, Scientific and Medical devices, wind monitoring radar systems, and other government uses also exist in the band. Fashioning a remedy where all users of the band co-exist requires more wisdom than Solomon. The Gas Utilities continue to believe that the solution which best serves the public interest is to find a suitable location in another band for the high power multilateration systems so they may conduct operations without having to worry about interference from or to other users. In this way only may the full potential for both uses of the spectrum, LMS and Part 15, be realized as the demand for these two competing uses continues to grow. The Gas Utilities therefore urge the Commission not to abandon this avenue of resolving this proceeding.

4. Nevertheless, it is the Gas Utilities' desire to assist the Commission's expeditious resolution of this proceeding in any possible way. Since the Commission appears to be considering the

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[3/] See attached Affidavit of Thomas G. Adcock, P.E. at paragraph 5. In his affidavit, Mr. Adcock presents a technical analysis of the staff proposal which is incorporated herein by reference.

band segmentation proposal informally advanced by the staff, the Gas Utilities wish to provide the Commission with their analysis to minimize the adverse affects on Part 15 users, while nonetheless allowing the development of LMS systems. To summarize the Gas Utilities' comments, any band segmentation proposal the Commission adopts should encompass the following elements:

(a) provide a safe haven for future Part 15 deployment;

(b) minimize dislocation of existing Part 15 devices;

(c) provide sufficient spectrum for competing LMS systems; and,

(d) limit the potential for interference between Part 15 and LMS users.

5. ***Wide Band Multilateration Systems.*** The authorization of wide-band multilateration LMS systems should be modified from that contained in the staff proposal to place these systems at 902-908 MHz and at 922-928 MHz. In addition, high powered forward links -- which do not appear to be specifically accounted for in the staff proposal -- should be limited to 25 KHz and located at the far end of the band, at 902-902.025 MHz and at 927.975-928 MHz.[4/] Moreover, a 10 watt ERP power limitation for mobile transmitters should be adopted, along with a 10 watt ERP/five meter antenna height above average terrain ("HAAT") limitation on fixed

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[4/] The Gas Utilities acknowledge the possibility of interference from adjacent licensees above or below the 902-928 MHz band to the forward link signal. Given the high power of that link, however, interference is unlikely in the Gas Utilities' view. To the extent such adjacent channel interference might occur, however, the party causing such interference should be responsible for its resolution.

transmitters operating more than ten percent of the time during any ten second period.[5/]

6. These modifications to the informal staff proposal are necessary to avoid displacement of existing Part 15 users,[6/] while nevertheless providing the multilateration LMS systems with adequate operating parameters. The placement of the wide-band LMS systems at the ends of the band would assist in preventing the dislocation of existing Part 15 users because these users have tended to cluster toward the center of the band in the expectation that LMS systems would be located at the ends of the band. Placement of the high powered forward links at the very ends of the

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[5/] Higher HAAT would be allowed with a corresponding ERP reduction.

[6/] The Gas Utilities generally support the "threshold" concept of the staff plan which would require Part 15 users to resolve interference to wide-band LMS systems if:

1. The Part 15 device is using outdoor transmit antennae which are more than five meters above ground level;

2. The Part 15 device is using equipment that does not meet revised Rule Section 15.247(b)'s limitation regarding antenna gain; or

3. The Part 15 device is a field disturbance device operating under Rule Section 15.245.

Those thresholds represent a good first step to draw the difficult to discern line between the interference wide-band systems must accept as the cost of locating in the crowded 902-928 MHz band and the requirement that Part 15 users not interfere with licensed users. The Gas Utilities do see some potential problems with their application, however. Because generally, the devices employed by the Gas Companies would not exceed these thresholds, the Gas Companies believe this matter would best be addressed by those parties who are most likely to be affected by such thresholds.

band would minimize their potential to interfere with low powered Part 15 devices located in other portions of the spectrum and provide the wide-band LMS systems themselves as guardbands to prevent blanketing of low powered devices and local LMS systems.[7/] The power and height limitations set forth above would serve a similar purpose. Because of the potential interfering nature of several near continuous calibration transmitters scattered throughout an area, the need to limit the height and power of these transmitters is evident. Moreover, as far as mobile transmitters are concerned, the transient nature of these devices requires a similar limitation to 10 watts ERP to minimize interference. In any event, mobile operations with power levels higher than 10 watts begins to pose a radiation exposure concern.[8/]

7. ***Part 15 Safe Haven.*** The Gas Utilities strongly urge the Commission to establish a safe haven for Part 15 use of the 910-920 MHz sub-band. The staff proposal looks in this direction; however,

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[7/] The Gas Utilities understand that the wide-band LMS providers would prefer to locate their high powered transmitters far away from the rest of their spectrum to minimize the possibility that they would interfere with themselves. This would be a poor decision on the Commission's part. The wide-band LMS proponents have gone to great lengths to assert their systems are not susceptible to interference. They have also downplayed the likelihood that their own systems will cause interference to other users of the band. Thus, the links ought to be included as part of their six megahertz block spectrum allocations. If interference does occur as a result of those forward links, the wide-band LMS systems would be in the best position to remedy that interference. Accordingly, whatever interference their high powered forward links might cause ought to be borne by, and remedied by the wide-band LMS systems themselves, and not by someone else.

[8/] See Adcock Affidavit at paragraph 11.

it falls short of providing the protection Part 15 devices need to remain and flourish in this band. Although some sharing of the 902-928 MHz band may be a possible, though certainly not an ideal solution, Part 15 devices cannot co-exist co-channeled with wide-band LMS systems due to the wide area over which such systems operate and the relatively high power levels at which they operate. Accordingly, the Gas Utilities urge the Commission not to allow wide-band LMS systems in this sub-band under any circumstances.

8. In this connection, although the Gas Utilities applaud the suggestion that LMS systems operate in this sub-band on a co-equal status with Part 15 devices, it is not a satisfactory solution in the case of wide-band LMS operation. This is because, as the Gas Utilities previously explained, there is a substantial likelihood that wide-band LMS systems will interfere with Part 15 devices to a much greater extent than Part 15 devices would interfere with wide-band LMS systems. Thus, co-equal status with wide-band LMS providers in this sub-band would effectively remove Part 15 users from this portion of the band.[9/]

9. ***Local LMS Systems.*** With respect to local LMS systems, the Gas Utilities' concerns are mainly definitional. As now operating, local LMS systems do not appear to be a serious interference threat to Part 15 users, nor do Part 15 users appear to be a serious interference threat to local LMS systems. It is

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[9/] The same concerns do not exist, however, with respect to local LMS systems. Accordingly, granting local LMS systems and Part 15 users co-equal status in the 910-920 MHz band is appropriate.

not clear, however, how local LMS systems will evolve. The Gas Utilities are concerned with the potential blurring of the lines between wide-band and local LMS systems. To control for this potentiality, the Commission should, inter alia, impose reasonable height-power limits on LMS systems. The Gas Utilities propose that local LMS systems be limited to 10 watts ERP at five meters HAAT -- with lesser power at higher HAATs -- except where highly directional antennae are employed.[10/] In addition, local LMS systems should be defined to consist of a limited number of coordinated transmitters covering a limited, specified area. Finally, the threshold criteria for Part 15 users to resolve interference to local LMS systems should apply equally to the 908-910 MHz and 910-912 MHz local LMS sub-bands.

10. ***Conclusion.*** As the Gas Utilities have shown above, the optimum resolution of this proceeding would be to relocate the wide-band LMS systems to clean spectrum. Understanding that this solution may not be possible, the Gas Utilities suggest that if the Commission intends to adopt a band segmentation proposal, the informal staff proposal recently advanced, with the modifications discussed above, would help to accommodate the conflicting needs of Part 15 and LMS users of the 902-928 MHz band. Specifically, wide-band LMS systems should be located at the opposite ends of the band; any high powered forward links should be limited to 25 KHz and located at the very ends of the band; height-power limitations

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[10/] Where highly directional antennae are employed, height-power levels could be increased dependant upon the directionality of the antennae.

should be imposed; and the concept of "thresholds" for Part 15 resolution of interference to LMS systems should be implemented. Moreover, the 910-920 MHz sub-band should be set aside as a safe haven for Part 15 operation, with wide-band systems not allowed within that sub-band, and with Part 15 and local LMS systems having co-equal status within that sub-band. By adopting the staff proposal with the above modifications, the Commission could achieve a workable, though admittedly less than ideal, resolution of this proceeding.

Respectfully submitted,

BAY STATE GAS COMPANY
THE BERKSHIRE GAS COMPANY
BLACKSTONE GAS COMPANY
BOSTON GAS COMPANY
BRISTOL AND WARREN GAS COMPANY
BROOKLYN UNION GAS COMPANY
CITY OF WESTFIELD GAS AND ELECTRIC LIGHT DEPARTMENT
CITY OF HOLYOKE, MASSACHUSETTS GAS AND ELECTRIC DEPARTMENT
COLONIAL GAS COMPANY
COMMONWEALTH GAS COMPANY
CONSUMERS POWER COMPANY
CONNECTICUT NATURAL GAS CORP.
ENERGYNORTH NATURAL GAS, INC.
ESSEX COUNTY GAS COMPANY
FALL RIVER GAS COMPANY
FITCHBURG GAS AND ELECTRIC LIGHT COMPANY
MINNEGASCO
NORTHERN UTILITIES, INC.
THE PEOPLES GAS LIGHT AND COKE COMPANY
SOUTHERN CALIFORNIA GAS COMPANY
THE PROVIDENCE GAS COMPANY
THE SOUTHERN CONNECTICUT GAS COMPANY
VALLEY GAS COMPANY
VERMONT GAS SYSTEMS
WAKEFIELD MUNICIPAL LIGHT DEPARTMENT
WASHINGTON GAS LIGHT COMPANY
WASHINGTON WATER POWER COMPANY
YANKEE GAS SERVICE COMPANY

By: _____
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Their Attorneys

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August 12, 1994

AFFIDAVIT

City of Washington :

: SS

District of Columbia :

I, THOMAS G. ADCOCK, P.E., having been first duly sworn, depose and state as follows:

1. I am a registered Professional Engineer in Washington, D.C. and the Director of Engineering for the firm of Lukas, McGowan, Nace and Gutierrez, Chartered.

2. I graduated from the United States Military Academy at West Point, New York in 1957 with a Bachelor of Science degree, and from the Massachusetts Institute of Technology, Cambridge, Massachusetts in 1963 with a degree of Masters of Science in Electrical Engineering. In addition, I have completed post-masters degree courses at New York University and George Washington University, and am a Senior Member of the Institute of Electrical and Electronic Engineers.

3. I am familiar with the Federal Communications Commission's ("FCC's") rules including Part 15, and since 1982 have prepared or supervised the preparation of the technical portions of hundreds of applications, engineering statements and other submissions filed with the FCC.

4. On behalf of an ad hoc coalition of natural gas distribution utilities ("Gas Utilities"), I have reviewed a copy of a summary of an informal FCC staff proposed plan for the 902-928 MHz band ("FCC Band Plan"). A copy of the text of the FCC Band Plan, as provided to me, is enclosed as Attachment 1. My comments concerning the FCC Band Plan are presented in the paragraphs below.

5. The principal problem with the FCC Band Plan is that it attempts to accommodate the simultaneous use of the 902-928 MHz band by two technically incompatible types of users. The fact that this technical issue has been raised previously should not detract from its veracity or significance. If both Part 15 devices and Location and Monitoring Service ("LMS") systems[1] proliferate as predicted by their respective proponents, harmful interference to both communities of users inevitably will result. Operations by non-MLS tag readers as presently deployed are not considered a problem due to their limited sitings at highway toll booths. Harmful interference, however, is considered a major problem with respect to Part 15 devices and wide band multilateration systems ("MLS"). This is because Part 15 devices have been designed to operate in an environment with many co-channel devices, but all meeting FCC rules concerning low power, wide band signals. These Part 15 devices were not designed to operate in the presence of high power co-channel signals, some wide band and some narrow band. Likewise, the MLS systems have only a limited ability, depending in part on the number of sites, to tolerate co-channel interference from transmitters co-located with their receivers sites.

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[1] As used herein, LMS includes multilateration systems, automatic vehicle monitoring systems, automatic tag readers, etc..

6. Presently, Part 15 devices are more numerous and represent a greater investment in dollars than LMS systems. Moreover, it is less difficult to relocate a new service than a well and widely established existing one. Therefore, an optimum solution would be to relocate wide band LMS to another band, perhaps one previously allocated for government use.

7. Presently the FCC Band Plan allows for LMS operations in all portions of the 902-928 MHz band. If LMS systems are to share the 902-928 MHz band with Part 15 users, then the low-power Part 15 community should be allocated a portion of the band as a "safe haven". Within the safe haven spectrum, Part 15 devices should be accorded primary or co-equal status. LMS systems should be limited to other parts of the 902-928 MHz, or preferably an alternative band. This would protect both Part 15 devices and LMS systems from harmful interference that would only increase with time, continuously detract from service to public as well as embroil the FCC in numerous and repetitive technical disputes. Height-power restrictions are needed to prevent interference to existing Part 15 devices.

8. With respect to MLS systems, the FCC Band Plan does not appear to address the high power narrow band forward link that is a part of the AirTouch Teletrac, and potentially other, MLS systems. This high power (e.g., 500 Watts) forward link represents a significant potential source of interference to Part 15 users. If this particular link is to be authorized within the 902-928 MHz band, it needs to be located so that it will not interfere with Part 15 devices; preferably it should be located at one of the very ends of the 902-928 MHz band. Moreover, these high

power MLS transmissions should be limited to a narrow band signal of no more than 25 kHz to minimize the potential for interference with other users of the band.

9. The FCC Band Plan addresses interference to LMS from Part 15 users through certain "thresholds" at which Part 15 users would be required to remedy interference to LMS systems, even though the FCC Band Plan states that interference between non-MLS systems and Part 15 devices is not considered to be a problem. Since the non-MLS portions of LMS is not defined, it is not possible to determine if mutual interference is possible, or even probable, between Part 15 and non-MLS devices. This lack of definition, technical rules and standards gives rise to concern. The introduction of non-MLS devices into the band - except for tag readers as deployed at present - should be in accordance with carefully prepared and detailed technical rules and standards yet to be adopted. These should ensure that the interference levels to Part 15 devices are not increased in any harmful manner.

10. A part of the FCC Band Plan entails a "threshold" affecting Part 15 devices based on antenna height above the ground level. In general, height limitations in FCC rules are more beneficial to protecting the shared use of a band where the height limitations are related to the radiated power levels, and where the height is measured as height above average terrain rather than height above the ground. In the case of Part 15 devices, these devices are very numerous and some are nomadic. Consequently, it may not be practical to impose height-power limitations on Part 15 devices.

11. The current standard for radiation safety levels is published by the Institute of Electrical and Electronic Engineers, Inc. ("IEEE") as IEEE C95.1-1991 (also American National Standard/IEEE C95-1-1992). A 915 MHz signal with 10 Watts effective radiated power would require a separation distance of at least 2.4 feet in an uncontrolled environment, and at least 1.1 feet in a controlled environment, to ensure safe levels of radiation.

12. Regardless of the part of the spectrum to be allocated, non-MLS, as well as MLS, portions of LMS need technical standards both for the equipment as well as for its operation to avoid interference with Part 15 devices. Technical standards developed and adopted by the FCC have served the public well thus far in allowing many diverse uses of the 902-928 MHz band by Part 15 devices. This process should be continued to ensure the continued beneficial use of the band by millions of these devices.

13. Interference to Part 15 devices by LMS systems, including MLS, is not addressed by the FCC Band Plan. The record to date, as reflected in various documents submitted to the FCC on behalf of Part 15 users, manufactures, associations, etc., shows that interference to LMS from Part 15 devices, as well as interference from Part 15 devices to LMS, will be a problem unless changes are made in the proposed use of the 902-928 MHz band. Specifically the establishment of a Part 15 safe haven in the 910-920 MHz sub-band and the establishment of height-power limitations for LMS systems is necessary to limit interference to Part 15 devices.

14. The foregoing statements of fact are true and correct to the best of my own personal knowledge and belief, and are proffered in good faith.

THOMAS G. ADCOCK, P.E.

Subscribed to and sworn to before me
this 12 day of Aug. 1

Notary Public

My commission expires: Oct 14 1996

Attachment 1

FCC Band Plan (Proposed)

1. The Band Plan

902-904	non-multilateration systems
904-910	multilateration systems
910-920	non-multilateration systems (option for multilateration)
920-926	multilateration systems
926-928	non-multilateration systems
902-928	Part 15 devices (however, in the two 6 MHz allocations, and in the 10 MHz optional multilateration band, special rules would apply to the operation of Part 15 devices).

(Note: The special rules which apply in the two 6 MHz allocations are the "thresholds" (see below). However, in those places where the 910-920 MHz band is used for multilateration systems (this is an option), the thresholds would not apply and Part 15 and Location and Monitoring Service ("LMS") would be coequal. The traditional Part 15 rules (must accept and cannot cause interference) would apply in all other circumstances.)

The FCC believes this plan should not present a problem because the non-multilateration systems apparently do not cause interference to, or receive interference from, Part 15.

2. Interference to LMS From Part 15
(Note: Part 15 must accept interference from LMS.)

If LMS systems experience interference from Part 15 devices, Part 15 operators are responsible for resolving the interference if any of the following occur, which are referred to as "thresholds":

A. The Part 15 device is using outdoor antennas which are more than 5 meters above ground; or,

B. The Part 15 device is using equipment that does not meet the June 1994 15.247(b) rules (regarding 6 dB antenna gain; equipment can be non-new rule in every other respect); or,

C. The Part 15 device is a field disturbance device operating under Section 15.245.

Resolution of interference can be by negotiation; it does not mean that Part 15 must immediately cease operation.

CERTIFICATE OF SERVICE

I, Vicki Ritter, Secretary, at the law firm of Lukas, McGowan, Nace & Gutierrez, Chartered, certify that true copies of the foregoing document have been caused to be hand delivered this 12th day of August 1994, to the following:

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Washington, DC 20554

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Federal Communications Commission
Room 844, 1919 M Street, NW
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Commissioner Rachelle B. Chong*
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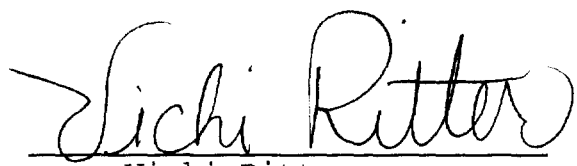

Vicki Ritter

*Hand Delivery